1998

HIGH SCHOOL

MATHEMATICS

SCORING GUIDES

SESSION 2

Session: 2
Item: 1
Page: 12-13
Content Standard(s): 4 Patterns and Relationships
Process Standard(s): 4.1

Score Points:

4 points

The student's response fully addresses the performance event.

The response:

- demonstrates knowledge of the mathematical concepts and principles needed to complete the event.
- communicates all process components that lead to an appropriate and systematic solution.
- may have only minor flaws with no effect on the reasonableness of the solution.

3 points

The student's response substantially addresses the performance event.

The response:

- demonstrates knowledge of the mathematical concepts and principles needed to complete the event.
- communicates most process components that lead to an appropriate and systematic solution.
- may have only minor flaws with minimal effect on the reasonableness of the solution.

2 points

The student's response partially addresses the performance event.

The response:

- demonstrates a limited knowledge of the mathematical concepts and principles needed to complete the event.
- communicates some process components that lead to an appropriate and systematic solution.
- may have flaws or extraneous information that indicates some lack of understanding or confusion.

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Content Standard(s): **4** Patterns and Relationships
Process Standard(s): **4.1**

1 point — The student's response minimally addresses the performance event.

The response:

- demonstrates a limited knowledge of the mathematical concepts and principles needed to complete the event.
- communicates few or no process components that lead to an appropriate and systematic solution.
- may have flaws or extraneous information that indicates lack of understanding or confusion.

0 points — Other-Responses not addressed by the Condition Codes:

Examples of "0":

Work consists of copying the prompt information only.
Work indicates no mathematical understanding of the task.

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Process Standard(s): 4.1

Sample Solution 1

Length of Phone Call	National Telex	Dial-Direct, Inc.
1	$0.35	$0.21
2	$0.47	$0.35
3	$0.59	$0.49
4	$0.71	$0.63
5	$0.83	$0.77
6	$0.95	$0.91
7	$1.07	$1.05
8	$1.19	$1.19
9	$1.31	$1.33
10	$1.43	$1.47

Recommendation:

Any explanation equivalent to the following, indicating the length of calls when each company is least expensive and when they are equal:

National Telex would have the lower cost when the length of a phone call is greater than 8 minutes. Dial-Direct, Inc. would have the lower cost when the length of a call is less than 8 minutes. If the call is 8 minutes, then the cost of the two companies is equal. Since most of our calls are at least 10 minutes, I would recommend that you choose National Telex.

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Sample Solution 2

x = number of minutes after the first minute n = number of minutes

National Telex: $35 + 12x$ = cost (in cents) or $35 + 12(n - 1)$ = cost (in cents)

Dial-Direct, Inc.: $21 + 14x$ = cost (in cents) or $21 + 14(n - 1)$ = cost (in cents)

$35 + 12x = 21 + 14x$
$14 = 2x$
x = 7 + first minute = 8 (minutes)

$35 + 12(n - 1) = 21 + 14(n - 1)$
$14 = 2(n - 1) = 2n - 2$
$2n = 16$
$n = 8$ (minutes)

Recommendation:

Same as in Sample Solution 1

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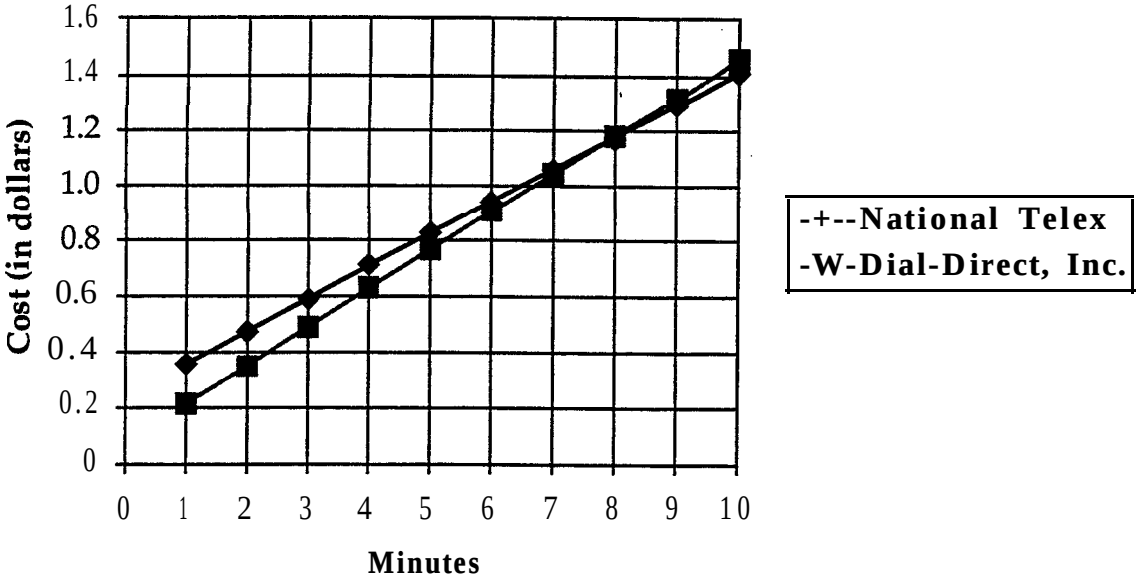
Process Standard(s): **4.1**

Sample Solution 3

COST COMPARISON



Note: Accept any answer that reasonably corresponds with the graph.

Recommendation:

Same as in Sample Solution 1

Session: 2
Item: 8
Page: 20
Content Standard(s): 2 Geometric/Spatial Sense and Measurement
Process Standard(s): 1.10

Exemplary Response:

- 13,188 (miles) if 3.14 is used for π

  OR

  approximately 13,195 (miles) if π is extended

  OR

  4200π (miles)

AND

- **2 x 3.14 x 2100**

  OR

  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation OR Correct answer
0 points	Other

Scoring Comments:

Some students extend π from 3.14 to 3.1415927 (probably the π key on their calculator). Answer using extended π is 13,194.69 or 13,195.

Truncating or rounding of answer is allowed.

Session: 2
Item: 9
Page: 21
Content Standard(s): 2 Geometric/Spatial Sense and Measurement
Process Standard(s): 3.7

Exemplary Response:

- 60,000,000 or 60,288,000 (square miles)
  OR
  60,318,579 (square miles) if π is extended
  OR
  19,200,000π (square miles)
  OR
  Equivalent appropriate answer

AND

- **100% − 70% = 30%**
  0.30(4 x 3.14 x 40002) =
  0.30(200,960,000)
  OR
  Other valid process

Score Points:

2 points	Exemplary Response
1 point	Correct process; error in computation OR Correct answer
0 points	Other

Scoring Comments:

Truncating or rounding is acceptable when students use the π key (on a calculator).

Session: 2
Item: 10
Page: 21
Content Standard(s): 1 Number Sense
Process Standard(s): 3.7

Exemplary Response:

- 3.72×10^7 or 3.7×10^7 (miles)

AND

- 6 min. 40 sec. = 400 sec.
  $400 \div 2 = 200$ sec.
  $186{,}000 \times 200 = 37{,}200{,}000$

  OR

  Other valid process

Score Points:

3 points	Exemplary Response
2 points	Correct process; error in computation AND Answer correctly expressed in scientific notation OR Correct process AND Correct answer not expressed in scientific notation OR Correct process AND Correct answer not expressed in correct scientific notation

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Content Standard(s): 1 Number Sense
Process Standard(s): 3.7

1 point	Correct answer expressed in scientific notation OR Correct answer not expressed in scientific notation OR Correct process without arriving at an answer OR Incorrect or no process but final decimal answer correctly expressed in scientific notation
0 points	Other

Scoring Comments:

Many students **doing** everything correctly EXCEPT dividing by 2 to make distance one **way.** This is an error in process, not in computation.